

KNOWLEDGE, ATTITUDE AND INFLUENTIAL FACTORS IN DECISION-MAKING AND ORGANIZATION OF ECOLOGICAL BASED PRODUCTION SYSTEMS OF BANANAS IN THE ATLANTIC FOREST OF RIO GRANDE DO SUL – BRAZIL

Daniela Garcez Wives

Universidade Federal do Rio Grande do sul

João Armando Dessimon Machado

Prof. DR - Programa de Pós-Graduação em Desenvolvimento Rural (PGDR)

Abstract

The main proposal of this work was to comprehend how internal factors influence the knowledge and decision-making of the farmers. Therefore, the production systems of ecological basis of banana in the Atlantic Forest in the state of Rio Grande do Sul – Brazil was observed. For that, 53 interviews have been carried out, which composed a non-probabilistic sample, and the data generated was analyzed through statistics and multivariate analysis tools. The results generated evidence for the comprehension that, in the organization of production systems, by the farmers, there is an important influence of their personal experiences and their values more closely connected to satisfaction and succession. Finally, it was observed that the elaborate construction of this work, considering the means of production, information system and regime of values, may be employed in different production systems.

Keywords: Decision-making. Attitude. Influential internal factors. Production systems. Social system.

1. Heading

For a better understanding of the rural spaces and the farmers, and all its complexity, an important question to consider is the productive alternatives and its ways of management. Therefore, it is fundamental to understand why and how men act and, specially, what are the influences operating over their actions. A pertinent statement in the studies of decision-making lay over the farmers' choices and in the factors that might influence these choices, whether these influences are external or internal. In production systems where the decision-making core is fundamentally familiar the management process may include the interference or be strongly oriented by factors related to elements that do not prioritize profit maximization, such as beliefs and values. There is a variety of internal factors, which exemplify the difficulty of taking decisions regarding the management of the production system. Determining different choices in different situations primarily goes by the comprehension of the distinct factors involved. Thereby, in this scenario the question that arises is comprehending how internal factors influence the decision-making of family

farmers and their way of productive organization? For this, the empirical case chosen to develop this study is the production systems of ecological basis of banana in the Atlantic Forest in the state of Rio Grande do Sul, due to the fact that such region contains a strong concentration of such production model that bases its decision-making at the family core.

In the global scale, banana comes in second in the most cultivated fruit's ranking. Brazil, according to data from the Food and Agriculture Organization of the United Nations - FAO (2009), is one of the largest producers of this fruit that has its origin in the Asiatic and African continents. In Rio Grande do Sul, the production is concentrated in the micro region of the Northern Shores at the Atlantic Forest area, which presents an agricultural profile related to conventional and ecological cultivation systems. This region is responsible for supplying 98% of the state market. In the Northern shore, banana farming¹ is located on the hillside of the Serra Geral formation, in a bordering enclave of the Coastal Plain, this being the only region of the state that presents the most favorable conditions to such cultivation. However, the terrain is very irregular, as a result of the dissection and the drainage that created slopes, valleys, small lowlands, and high declivities, originally occupied by the Atlantic rain forest.

It is noticed that, in the agricultural developments, planning, execution, and control are fundamental, those which are standard procedures in order to reach the desired goals and objectives. That way, the understanding of how and why the farmers act and determine their decisions, as well as how choices or the motives that influence them to act a certain way, are fundamental to understand the big picture. In that sense, it is important to explore their information and decision-making systems, as well as their values, which are directly associated to their way of life.

We should have our attention at a relevant factor to be observed, which is born from the concrete, that is, by looking at an agricultural production unit (APU) and observe its production system set into practice, we have, overall, an image positioned in time and space. A diagnosis can be made, its functioning studied, however, there is no sight of what is behind this image positioned in time and space, i.e. we only have the vision of the concrete materialize action in the system. However, the farmer makes certain choices in a scenario where there are possibilities that can be explored. There is a choice for a certain action instead of any other, which implies in the characterization of his system. Thus, something operates, acts upon its decision makers, influencing his choices.

Thus, this work has seek to expand and deepen the theoretical and empirical perception and approach in relation to the decision-making system and also investigate subsidies so that we can understand which factors influence the behavior and the manner how the production systems are organized by the family farmers. Considering the decision process in the scope of rural spaces and pondering that the farmer, in general, is immersed in the relationships of his family core, understanding his action taking in consideration the internal influential factors can generate fundamental clues to be able to handle its orientation regimes and how these imply his behavior and his respective production systems. In other words, the relevance of this study stands in the fact that multiple farmers' objectives and values imply in multiple ways of management and organization of the production systems.

¹ For further information, check Wives (2008).

2. Decision, values, beliefs, and information

The decision process begins with the perception of some kind of stimulus to the manager, which suggests that a decision has to be made in order to reach some objective or to adjust the environment for a new situation (CEZAR, 1999). In rural studies, it is considered that the farmer's objectives in which several courses of action are selected from a set of available alternatives. That way, an adequate decision is pondered, in other words, a rational choice is based in the interpretation of the information available (SIMON, 1970).

The decision-making has been defined, as pointed by Machado et al. (2006), as a process of analysis and choice between multiple available alternatives to define or establish an action. The theory of decision seeks to explain, among diverse scopes, the different choices of the decision makers.

Seeking approaches that take into consideration the influence of the objectives, values and behavior denotes the search for a broad approach regarding the decision systems within the rural spaces. Based on that, it is possible to verify some other studies that followed a behavioral approach; an example is the study presented by Gasson and Potter (1988). The behavioral approach provides a basis to learn the relation between attitude and behavior. In the studies that focus in the rural spaces, as Burton (2004) exposes, they can be characterized as those that seek to comprehend the behavior of the decision makers, who are generally the farmers, or the property or rural entrepreneurship managers. These studies have their focus in psychological constructions, such as attitudes, beliefs, and values, but also commonly seek to collect additional data about the situation of the property studied, such as economical structure (land, labor, capital), characteristics of the natural environment and succession questions, etc. In family developments, according to Gasson et al. (1988), Errington and Gasson (1994) and Perkin and Rehman (1994), the decision processes can involve several people, in this case the family members that not necessarily share the same objectives.

The situation of choice can be considered, according to Lewin (1965), a situation where there are many possibilities. The person that is making a decision generally alternates between seeing himself in a future situation that corresponds to where one or other possibility fluctuates; when a decision is made, one of those situations permanently acquires the dominant potency. In a choice between activities of different degrees of difficulty, the decision is influenced by the probability of success or failure in each task. The acknowledgment of the situation or of this social space, in which the farmer is inserted, as argued by Rodrigues et al. (2010), generates the environment for the formation of attitudes, and these may be considered as the feelings towards or against people or things that surround them. Thus, the authors expose that the attitudes can be defined like an arrangement in favor of an object, objectives, values and cognitions. The farmer's logic and the way how they perform the organization of their establishment must broadly integrate the situations which refer to the internal and external environment. Gasson (1973), Gasson et al. (1998) and Romero and Rehman (2003), based on their studies, expose that the neoclassic economical theory, having the maximization of profit as a basic criteria, shows itself unsatisfactory as theoretical contribution of the ways of *modus operandi* of rural organizations. According to Gasson (1973), Romero and Rheman (2003) and Beedell and Rhenam (1999), it is fundamental the need to establish a balance between multiple objectives and values, meaning, they should be considered and reconciled. There are few

specific studies that consider the importance of the internal influential factors in the decision making of rural producers, according to Machado et al. (2006).

A pioneer work that considered the importance of values and objectives in the farmers' decision was developed by Gasson (1973) through an empirical investigation with around one hundred respondents in Cambridge, England. Gasson (1973) created a classification the sought to understand the farmers according to their objectives and values based not only in economical factors, but, also, considering other factors such as cultural, societal, and psychological influences in the analysis. Gasson (1973) classifies values into four types of orientation regime in the decision-making process:

- a) Instrumental orientation: the values associated are to maximize the benefit, obtain enough of a benefit, expand the business and have pleasant work conditions;
- b) Social orientation: the values associated to this orientation are social prestige, the relationship with the rural community, keeping the family tradition, working with other family members, and keeping good relations with other workers;
- c) Expressive orientation: These are associated values, such as the satisfaction in feeling himself as owner, working himself in the property, exercise special abilities and aptitudes, having the opportunity to be creative at work, determining a schedule and reaching the set objectives.
- d) Intrinsic orientation: to this orientation the following values are associated: satisfaction with the job, enjoying the agricultural and outdoors work, valuing hard work, independence in work decisions, accepting and managing risk situations.

In the case of information and knowledge, along the years, several studies have been done to define what the meaning of "knowledge" is and to explain its process of acquisition and reasoning. The most current and significant studies are in the areas of sociology, psychology and cognition. In such areas, knowledge is understood as being the way in which a person perceives the world (Mizzaro, 1996). Resulting from this, each person has their version of the real world, maintained internally; however, the knowledge of a person may change with time, given that he is in constant interaction with the environment. The knowledge of a person at any given time is called the state of knowledge (Mizzaro, 1996).

Knowledge can be seen, according to Kochen (1974), as a kind of "potential energy" for certain types of actions, and people use it to perform tasks and solve problems that arise in everyday life (decision-making). Knowledge can also be defined as information along with the way this information can be used to solve problems. I.e., to make decisions and solve their problems men need information.

An organization, according to Citroen (2011), uses information strategically to make sense of changes in its environment, to create new knowledge, to create innovation and to make decisions about their course of action. Machado et al. (2006) point out that because of someone gives information a context, a meaning, an interpretation, knowledge becomes the most precious asset of a person or organization. There is, therefore, a process of reflection of someone about something, being added to it his own wisdom and the consideration of its wider implications. The authors call attention to the fact that the term still suggests the synthesis of multiple information sources.

The information alone does not generate support for a decision; its importance as claims Citroen (2011), is based on the fact that each piece of information should be located, accessed, retrieved, signified, analyzed and used before a decision is made. There are limits to the amount of information that can be collected and

processed in a rational way, by a decision maker, the decision-making process. In the case of farmers, knowledge and information need to have a broader meaning, involving a social context of interests, emerging as a product of interaction and dialogue between farmers, external and internal environment, and also by involving their families.

3. Methodological procedures

The defined area to conduct this study area is located in the micro region of *Osório*, where five municipalities were selected: *Torres*, *Mampituba*, *Dom Pedro de Alcântara*, *Morrinhos do Sul* and *TrêsForquilhas*. In this study, the defined population is the banana producers of ecological basis. It is estimated that there are around 450-500 farmers dedicated to the cultivation of banana of ecological basis throughout the micro region of the North Shore. The sampling was non-random, where the respondents were determined by convenience. In this study, the most accessible population members were interviewed in the period of May-August 2012. Thus, faced with a population of 500 banana producers of ecological basis, the minimum sample size was 53 farmers, to whom closed questions were asked, arranged based on the Likert scale². This study guide engendered 19 indicators of socioeconomic character, 5 of agroeconomic performance, 29 of information and 21 behavioral indicators.

According to Dufumier (1996) the agroeconomic character indicators analyzed were: Useful Agricultural Surface - Useful Agricultural Surface Banana (UAS - UASB): measures the area (in hectares) that is actually cultivated by the producer. It is considered the area occupied by plant and animal production activities.

- a) Total Agricultural Surface (TAS): measures the area (in hectares) of the total property.
- b) Unit of Man Work (UMW): measures the amount of time worked per unit of labor. It uses the value of 300 days-man or 2400 hours per year of work.
- c) Gross Product (GP): corresponds to the end value of agricultural products and manufactured products (crafts, homemade agribusiness, etc.) generated during the agricultural year in the Unit of Agricultural Production. It also integrates the GP the production sold or used as a form of payment of third-party services, the agricultural production consumed by the family, the stored production (crop and livestock ready for slaughter / marketing) and the production used to feed employees.

And the behavioral variables analyzed were: maximize profits, expand the business, pleasant working conditions, obtaining good compensation (satisfactory), guarantee income for the future, having social prestige, relationship with the community, continuing the family tradition, family work, having a good relationship with employees, feel satisfaction in feeling himself as owner, satisfaction in working on his own property, exercising aptitudes and special skills, being creative, flexibility in the schedule, reach goals, job satisfaction, satisfaction with agricultural and outdoors work, valuing hard work, independence in work decisions, accepting and managing risk situations.

² The Likert scale, according to Malhotra (2001), is named after its creator (Rensis Likert) and is a widely used rating scale that requires respondents to indicate a degree of agreement or disagreement with each of a series of statements about the stimulus objects. Typically, each scale item has five response categories ranging from strongly disagree to strongly agree.

In processing the data, the Statistical Package for Social Science (SPSS) software was used. To develop the data description, techniques for descriptive statistics were primarily used, which allowed the data set represented by the sample to be presented and described in various angles. Two methods were used for data presentation: a plot involving tabular or graphical presentation, and another with numerical data, involving measurements of position. In a second phase of quantitative data analysis, factor analysis, and finally a cluster analysis were utilized.

Subsidizing the observations to meet the second and third objectives, the variables, relating to internal influential factors, were treated in two stages. It was first developed, using the framework of descriptive statistics, the socioeconomic profile of the sample, after that a factorial was executed that sought to reveal how farmers build their information systems and, after, another factorial aimed to determine which variables explain their regime of value orientation.

Factorial analysis, as highlighted by Malhotra (2001) and Hair (2009), is a generic name that denotes a class of processes used primarily for data reduction and summarization. For identifying the matrix correlation, the Bartlett's sphericity test was used and for measuring the adequacy of the sample the Kaiser Meyer Olkin (KMO) following Field's parameters (2009) was used. Another important parameter highlighted by Field (2009) to verify the adequacy of the sample refers to the values of commonality, which may not be less than 0.6. He further argues that, with all values above 0.6, even for relatively small samples (below 100), it can be perfectly adequate.

To perform the extraction of the factors, the principal components method of analyzing the correlation matrix and Eigenvalues above one was used. The factorial matrix was executed according to Field (2009), by the orthogonal method, Varimax approach. This approach aims to redistribute the variance of the first factors to the last, reaching a simpler and, theoretically, more meaningful factor pattern. We attempted to reduce the original set of variables to a more manageable size, but retaining as much as possible of the original information. According to Hair et al. (2009), the factorial loadings to be considered relevant must present a load with values greater than or equal to 0.40.

From the twenty-nine information variables, through factorial analysis, nine factors were established and from the twenty-one variable of the regime of values, six factors were extracted, for a total of fifteen factors. The factorial tests performed to analyze the information system of the present sample reached the value of 867.731 for the Bartlett's sphericity test, which indicates that there was rejection of the null hypothesis. In the measuring test of sample adequacy (KMO) a result of 0.583 was obtained. All commonalities were above 0.6. Thus, using the parameters defined in Field (2009), it can be stated that these two values obtained in both tests confirm the adequacy of this analysis.

Using the criterion of latent root or Eigenvalue for the number of factors to be extracted, nine factors that explain 75.29% of total variance were yielded, which is satisfactory, as Hair et al. (2009) consider that the minimum should be 60%. Having identified the relevant factorial loads, it was observed that it was not necessary to exclude variables, since none had less than 0.60 commonality.

By doing the factorial tests, which analyzed the variables related to the system of value orientation, the result for the Bartlett's sphericity test was 506.121, which means that there is rejection of the null hypothesis. The result of the measure of adequacy of the sample test (KMO) was 0.53 and commonalities were over

0.6. Both results are in accordance with the parameters set in Field (2009), which in turn confirms the suitability of the analysis.

Six factors that explain 70% of the total variance were obtained, which were gathered using the latent root or Eigenvalue criteria, which, according to Hair et al. (2009) is satisfactory considering that the minimum should be 60%. Examining the communality of each variable, values above 0.60 for all were observed, so there were no exclusions. A cluster analysis was also performed; thus, once the factors were identified, there was grouping with the variables that make up the database, and from that we sought to identify the main groupings or representative "types" of farmers involved in the cultivation of banana.

As in factorial analysis, Malhotra (2001) emphasizes that the cluster analysis studies a whole set of interdependent relationships. Cluster analysis does not distinguish between dependent and independent variables; on the contrary, it examines relations of interdependence between the whole set of variables. Its main objective is to classify objects into relatively homogeneous groups based on the set of variables considered. The goals of a group (cluster) are relatively similar in terms of these variables, and different objects of other groups. That is, the cluster analysis according to Malhotra (2001) has been described as a clustering technique of individuals or objects in different sets according to their similarity. The technique consists of determining whether distinct groups can be identified within a data set.

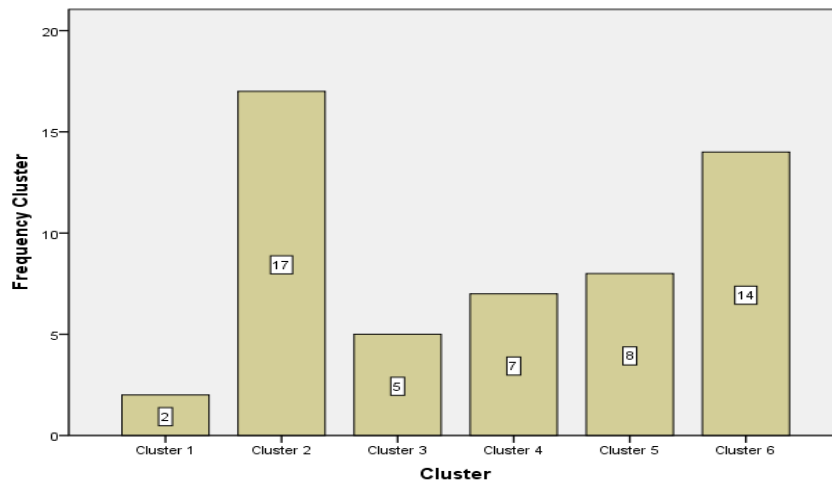
With the possession of these 15 factors, the other variables investigated in this study were grouped in order to perform the procedure of grouping through the technique of cluster analysis. For such, an analysis of hierarchical clustering was employed, Ward's method, and as a measure of similarity the Squared Euclidean Distance was used. The cluster analysis generated six groups.

4. Analysis and discussion of the results

Through factorial analysis, fifteen factors were extracted, and these factors were grouped with the other variables investigated in this study to determine the internal factors. This set of variables was used to perform a cluster analysis, and this procedure yielded six groups, as shown in Figure 1.

Cluster 1, called creative banana growers, is composed of two respondents. The second cluster, called satisfied banana growers, is composed of 17 elements (the highest number of observations of all the identified clusters). Cluster 3 is titled banana-grower entrepreneurs, composed of five elements. The name satisfied banana growers, compensation and work was given to cluster 4, which is determined by seven elements. Cluster 5 has 8 elements and was called satisfied banana growers compensation and family. Finally, the last cluster, which consists of 14 elements, was calling satisfied banana growers and family.

Figure 1 - Clusters and dispersion of farmers



Source: Field research (2012).

Thus, from these groups we sought to understand how internal factors are reflected in the different groups and in the decision-making of farmers studied, so we focused on the details of how internal factors influence the decision making of farmers and consequently the inner organization of their properties. This characterization and cross-checking helped create a broad overview analysis of their production systems, where the technical, productive, and behavioral aspects of information systems for farmers could be deeply analyzed, as shown in the summary table in Table 1.

Table 1 - Summary table of the characterization of Clusters: 1 - 6

	Cluster 1	Cluster 2	Cluster 3	Cluster 4	Cluster 5	Cluster 6
Education	High – Higher level	Low – Incomplete elementary school	Medium – High School	Low – Incomplete elementary school	Low – Incomplete elementary school	Low – Incomplete elementary school
Age – Minimum and Maximum (years)	29/67	47/64	29/63	31/55	32/56	43/57
Parents also farmers (%)	50	100	100	100	100	100
Parents from same region (%)	50	100	100	80	100	93
Experience in activity (years)	35	38	29,5	18	40	34,6
Inheritance (%)	0	27	49	21,4	53,8	39,6
Purchase (%)	100	66,5	35	64,3	33,7	56,1
Lease (%)	0	6,5	16	14,3	12,5	4,3
Intends to continue in agriculture (%)	100	100	100	100	100	92,9

Would like to have succession (%)	100	100	100	71,4	75,00	85,7
Succession (%)	50%	94,1	80	28,6	25	78,6
Family Size	2-4	2-4	2-4	Até 2	2-4	2-4
Co-op/Association participation (%)	100	88,2	100	85,7	87,5	100
Trade Union participation (%)	50	82,4	20	28,6	87,5	71,4
TS (ha)	9,65	19,92	9,00	3,45	5,65	13,79
UAS (ha)	4,00	13,70	7,50	2,50	3,78	6,79
UMW	1,54	1,38	0,76	0,49	1,21	0,80
GP/UAS (R\$-month)	992,28	475,66	495,24	825,51	1.173,09	451,36
GP (R\$)	47.629,50	78.199,00	44.571,80	24.765,57	53.211,62	36.506,35
Percentage of income from banana cultivation (%)	60	60	50	45	87,5	73,5
Family-centered decisions (%)	100	100	80	85,7	87,5	92,7
Information factors	1-Media 8-System change 7-Learning	4-Farmers 3-Personal relationships	5-Co-op/Associations 4-Farmers 1-Media	9-Personal experience 8-System change	7-Learning 1-Media	4-Farmers 8-System change
Value orientation factors	1-Creativity 6-Social	4-Satisfaction 5-Family	2-Income 4-Satisfaction	4-Satisfaction 2-Income	4-Satisfaction 2-Income 1-Creativity 6-Social 5-Family	4-Satisfaction 5-Family

source: Field research (2012).

It can be argued, based on the systematic data in Table 1, that we found a scenario that corroborates with what Gasson (1973) observed, in which the size of the property is in some way related to the regime of value orientation of the farmers. However, his study found that larger farms have more values associated with maximizing monetary inputs, i.e., the properties with greater extent of area would be the ones in which the instrumental arrangements would have a higher percentage rate. In properties with smaller areas there would be a greater bond with values linked to social and intrinsic regime. Precisely the opposite was

identified: it is the groups with less extensive area, meaning Clusters 3, 4 and 5, in which the values appear linked to the monetary issue, however it is important to note that only in Cluster 3 this is the main associated value. Thus, where we notice the decisions centered on wellness, tradition, maintaining the cohesion of the family, instead of making decisions thinking purely in terms of financial return, it is where the highest percentage rates exist in Cluster 1, Cluster 2 and Cluster 6, those being the three groups with the largest total areas (TAS).

Another important point to note is that four elements are prominent in all groups, which are the focus in the decisions facing families with an average percentage of 91%, the high percentage of intention to continue in agriculture with an average percentage of 98.8%, the desire that their children succeed them has an average percentage of 88.7% and a significant number of successors is already established.

Analyzing their distinctions, one can observe that the Cluster 1 - Creative banana growers has the highest degree of formal education, followed by Cluster 3 – Banana-grower entrepreneurs. In the others, it stands out as predominant farmers with incomplete elementary school education, thus characterized by low formal education and habits in relation to low and middle reading.

With the exception of Cluster 4, the other groups have around thirty years of experience as farmers. Except Cluster 1, the other groups have in the composition of their properties, a percentage of inherited land with an 83-year average that the land belongs in the family. In general, all groups showed a high percentage of families that have their origins in the region and in agriculture.

Another element observed was the succession process: it was observed that the three groups with the highest degree of successors already established are in Cluster 2, in which there is 100% desire to remain in agriculture and their children to succeed them, followed by Cluster 3 with an index of 80% of established successors and Cluster 6, which has a percentage of 78.6% of succession.

Groups in which the information system base elements from the media and cooperatives and associations are Cluster 1 and Cluster 3. In Clusters 2 and 6 the information considered the most relevant originates in the trading with other farmers, and in Clusters 4 and 5 the information from their own experiences is considered. Analyzing their value orientations one can notice that some groups have similar values, such as Clusters 2 and 6, where satisfaction and family are the most significant values. In terms of values linked to compensation, Clusters 3, 4 and 5 stand out. The only group that considers values linked to creativity and sociability as more relevant is Cluster 1.

Analyzing these elements, we might infer that groups 4 and 5, in particular, are those with the least and most years of experience in the activity, those who rely on information factors derived from their experiences, either considering it as sources of quality information, or to change something in your production system, or to develop and organize their production system. As already presented before, these two groups have little formal education, and also have the main factor value orientation factor 4 - Satisfaction. Those are the youngest groups, and have the lowest percentage of successors established. They also have also smaller areas of TAS and UAS and have more than 50% of the composition of their properties originated from purchase, both focusing their decisions in the family with an average 87.5%.

Clusters 2 and 6, are those with the largest areas of TAS, but in Cluster 6 the lowest GP / UAS rate among the six groups (and very similar to Cluster 2) can be observed. With regard to information systems, these

are based on information factors 4 - farmers. However, it is essential to emphasize that these two groups in relation to their value orientation consider relevant factors such as 4 - satisfaction and 5 - family.

It is observed in Clusters 1 and 3 the highest levels of formal education and both have similar sizes of TAS, but the UAS has a difference of almost 50%, despite both having very similar values of GP. Their similarities cease with these observations because, analyzing all other elements presented in Figure 38, we can notice these differences. Their information systems are founded basically on different elements, with the exception of the information coming from the media. Such a scenario is also reflected in their value orientation, wherein Cluster 1 considers important values associated with creativity, sociability and status, while in Cluster 3 values such as compensation and satisfaction are evidenced.

Among the groups analyzed in this work, Cluster 5 stands out with the best productive performance (GP / UAS), which has a low level of formal education, despite not having the largest production areas and also not having a significant participation in co-ops/ associations and unions. It stands out for having the lowest percentage of succession.

It was evidenced that there is a very broad articulation between internal influential factors, whether it is the means of production, or value orientation, or information systems. I.e., farmers use different elements to organize their production systems and their properties.

In relation to the information system it was shown that the way how the information is implemented passes through different forms and attributes such as age, experience, education level and value orientation. It was found that such variables of information indicated with the greater importance are connected to the personal experience of the producer, which are: importance when performing system changes, importance as a source of quality information, importance as a source of information for their activity, and the importance of knowing new information for the activity (new management techniques or new inputs).

As for values and their different forms of articulation, some studies such as those conducted by Errington and Gasson (1994), Gasson and Errington (1993), Rodriguez Ocaña (1996) and Perkin and Rehman (1994) also showed that they can unify multiple objectives. Thus corroborating with the study cited above, it can be stated that it could be visualized for the six groups studied in this work that there is a use of different value orientations to establish their decisions regarding the management approach and consequent organization of systems.

In their study, Errington and Gasson (1994) found that in general the main objective of the farmers in the European case, was the desire to keep their name on earth, meaning, to establish a successor and remain in agriculture, though, noting that two paths could be sustained by these objectives and that an important distinction should be made to understand which strategies were employed by the farmers. For if on the one hand some would like the family to be responsible for continuing to cultivate a certain piece of land, on the other hand there would be those farmers focusing only on finding a successor who would continue on the property and in agriculture. Importantly, even in different ways the central goal is to establish a successor and ensure the permanence of the family in agriculture.

Thus, it was observed that the expression of the family members that materializes through the long-term projects (goals) is constructed aiming at permanence of their families in agriculture, manifested by the desire of succession, the pursuit of delivering a sufficient level of income to support the family, and to keep

the production unit in a dynamic evolution. Thereby, ensuring the cohesion of the family and especially the maintenance of its space and land in the family.

This way, it is essential to emphasize that, for the case studied, the long-term projects are the expression of the values of these decision makers. Thus, it is essential to clarify that the values do not change quickly and fleetingly. They have a characteristic of standing time, as they are the basis for determining the behavior and attitudes. Therefore, using the behavioral approach, it became clear that there is an order to understand such behavior, which in a cycle of prediction must first pass through the values. Values are the foundation, and are followed by attitudes which are influenced by internal or external control mechanisms of the subject, characterizing his behavior. The behavior is, therefore, the result of a cycle (values, attitudes, and mechanisms of control and action) and, therefore, a clarification becomes relevant and concerns the reason why so many distinct articulations are observed within the six groups in relation to the means of production, information systems and value orientation. Such distinctions undergo the reflection made by the decision maker, to which the decision-making process is immersed in their close family and their values. So, it is essential to state that the long-term decision making is representing the decision makers, where the core decision-making focuses on the family and there is a difficulty in differentiating between the production and the idea of family, where the land is an element experienced in generations as a way of life, as their "place."

The decision-making, considering actions from short-term goals is where a strategy is defined. In other words, a set of objectives to carry out any operation that will mobilize resources to program the technical procedures of the operational management of the means of production of the production unit.

It was evidenced, therefore, that there is a very broad articulation between internal influential factors, as demonstrated by the data presented in Figure 3, wherein they are the means of production or information systems. Meaning, it can be stated that the six groups studied articulate in different ways the elements within their production systems. Moreover, in concrete terms, their properties over time are the result of choices and strategies within their system of decision-making in the short term. In this observed case, there is a strategy of organization in relation to conditions and available resources, such as land, labor, capital, technology, values and information to articulate actions that include decision-making. These decisions are quickly assessed in their cycle of learning and can be replicated, or not, depending on the interpretation of the result. Thus, in the short-term decision system, attitudes can be changed quickly according to changes in the environment or in the means of production. Thus, it can be said that within that system there is a dynamic process of decisions that involve a short-term impact, and the information system and the means of production may accompany this dynamicity and speed of decisions, but without losing sight that behind the control system there is a system of goals with their long-term strategies and values.

Finally, if on one hand the long-term system has some permanence in time, on the other hand the short-term system is essentially a continuous and rapid process of adaptation. Thus, the system is in the short-term in a cyclical process of adaptation to a long-term system. In the short-term system, the learning cycle is related to the information originated mainly from the experience of the decision maker and how she interprets the long-term strategies, risks, economic improvement, means of production and the technique that defines and redefines a field of possibilities in her property.

Therefore, it can be argued that for the farmers observed in this study, the decisions go through an examination of elements, of internal organization of the properties, with which they can design the present and future actions, which in this case are related to the permanence of their families in agriculture and the expectation of succession. Thus, the time scale may be an important element.

Insomuch, the general characteristics observed in this study suggest that these are farmers who make their decisions on family planning, with extensive experience in the activity, with production indicators that allow them economic reproduction and a differentiated succession pattern.

5. Final considerations

This paper concludes that the process of reflection of the decisionmakers observed passes through their own wisdom and know-how, extensive knowledge of the place and years of experience in the activity. The most relevant results, for their decision, are the variables linked to their own experience.

Therefore, the knowledge he gained from past experiences is valued to solve problems and make decisions. However, one can derive that in addition to the perspective of their activity and property, there is a process of construction of his information system, which does not occur simply by watching the results of their work in the individual cognitive field, although his experiences have great importance, as evidenced in this work. In addition, a factorial analysis intended to condense the variables was drafted, and nine factors were obtained.

Regarding value orientation regimes, it was observed that the variables with higher averages and greater consensus among the respondents are linked to values based on working on its own property, feeling satisfaction in the ownership, enjoying the farm and outdoors work, secure income for the future, obtain a good income, working with family, continue the family tradition and pleasant working conditions.

With averages below four and less homogeneity among respondents, values such as maximize profit, expand the business (entrepreneurship), achieve goals, exercise skills and special aptitudes, accept and manage risk situations, be able to be creative at work, valuing hard work, social prestige (status) and good relationship with workers were identified.

Through factorial analysis, six factors were extracted, and for such the same attributes of values suggested in Gasson (1973) were used; in this work, the referred author suggests four regimes of value orientation. However, it is concluded that, for the case studied here, there exists a more complex interaction in relation to base and triggering of values by these farmers. Moreover, as for those, the formation of their systems of values, considering what has been suggested by that author, tend to greater complexity of decision-making, since the prediction of behavior should take into account their values and how these are employed or triggered at times of their choice.

It was identified that there is a strong instrumental orientation, given by the values related to income security for the future, earning a sufficient income and having pleasant conditions to perform the work. However, the most important values identified by this study are the expressive regime, and also, it can be observed, some values of social orientation, noted as relevant. Thus, it is characterized that there is a peculiar combination of values of different regimes to compose the expression of the study group.

Such peculiarities, to some extent, are based on preserving the property and transform it, besides the maximization of production, a space of family life, and to preserve the heritage and expand it so that it can ensure a quality of life and a pleasurable working space for the family and their reproduction in the long-term.

Thus, from the six groups, it was possible to visualize how the internal factors are established in different production systems of ecological basis of banana. Given that the individual analysis of each cluster demonstrated a distinct mode of articulation in relation to the means of production, information systems and value orientation. So then we can see that these differences go through the decision maker, but this decision-making process is immersed in his household.

Concluding, if on one hand the system has some long-term permanence in time, in the other, the short-term system is essentially a continuous and rapid process of adaptation. Therefore, the control system is a cyclical process of adaptation to the long-term system. Thereby, it is possible to argue that in relation to the farmers observed in this study, the decisions undergo an examination of elements of availability of means of production such as land, capital and labor, which according to its information and value orientation system are organized internally in the properties. Keeping in mind that these relationships are intertwined with their goals, in order to design the present and future actions, which in this case observed is related to their permanence in the agriculture and the expectation of succession. Allowing us to emphasize that for these decision makers, where the core decision-making is located in the family, there is a difficulty in differentiating between the production and the idea of family.

Within the scope of theoretical, methodological material used to develop this study, it was possible to achieve the answers to the questions that guided it. It also provided a deeper understanding of the theoretical and empirical approach to the decision-making system, in such a way that it generated subsidies to examine and learn how internal factors influence behavior and how the productive systems are organized by the farmers. Finally, it was observed that the elaborate construction for this work, considering the means of production, information system and the regime of values, can be used in different production systems to understand their decision-making system.

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